Indicators and associated data that are candidates for inclusion in the "State of the Environment" report were extensively documented. The information requested in the attached document is intended to allow an impartial technical review of how useful the indicator is in answering specific environmental management questions and to validate that the underlying data are appropriate to answer national-level questions.

A. General Background

1. What is the theme this indicator is part of (e.g., land, water, air, global change, human health, ecological health)?

2. What is the name of the Indicator/data set?

3. What is the question the indicator set is being proposed to address?

4. How does this indicator address the questions? (conceptual relevance)

5. Does this indicator/data set require additional processing to optimally address this question and if so, what?

6. Has this indicator previously been peer reviewed? If so, please provide details. This question has been moved from Data Processing and Analysis section.

B. Data Quality

1. What is the known quality of the entire data set?

2. Has any standard data documentation, such as FGDC metadata, been developed to support these data? (If yes, please provide reference or source.)

3. Why were the data originally collected (e.g., what is being measured or monitored)?

4. Were data collected under a single program or were data from multiple programs combined? If multiple data sets were combined please address the quality for each data set independently.

5. What was (were) the program or programs under which the data were collected?

6. Did these programs have quality assurance plans to verify, corroborate, ground truth or otherwise assess the accuracy of the data?

7. If yes, are the quality assurance program plans available (and where)?

8. Were the quality assurance plans followed?

9. Were the analytical methods used consistent throughout the data set?

10. If not what effects could the different analytical methods have on the indicator results?

11. Are you aware of any sources of error that may affect the findings developed from these data? Error types could include errors of omission, commission, mis-classification, incorrect georeferencing, mis-documentation or mistakes in the processing of data. This question is

revised from “What are some of the uncertainties of the data and……on the findings.”

C. Sample Design

1. Generally describe how the data are/were collected (Research, general monitoring, compliance monitoring, regulatory requirement)? If collected under a regulatory requirement, please specify the regulation and links to the regulation and associated guidance.

2. What was the sample design or the monitoring plan?

3. Were any specific strata omitted from the sampling plan (e.g., small systems not in the sampling plan, roads less than 2 miles long, habitat types less than 20 acres)?

4. Which of the processes below was used to select the sites where information is/was collected?

    a) Sites selected using a statistical design that enables generalization to entire resource (e.g., probability survey design to select sample of lakes or streams for the United States. such as NRI, NASS, FHM, FIA)
    b) Sites determined to meet administrative or regulatory requirements such as sources of or water supply systems.
    c) Sites chosen to address suspected or known problems (e.g., Hot spots).
    d) Randomly selected sites.
    e) Sites selected in unknown way.

5. When did the monitoring begin?

6. When did the monitoring end?

7. What was the periodicity of the sample (yearly, seasonally, quarterly, monthly, weekly, daily, etc.)?

8. Were there any major gaps in the data either spatially or temporally (please explain)

D. Coverage

1. Is there uniform national coverage of information for this indicator?

2. Were data collected in some areas but not others?

3. Was the data collected using remote sensing? If yes please specify the sensor, date and the resolution of the data.

4. If the data are derived from mapped information, what was the original map scale or resolution?

E. Data Processing and Analyses

1. What kinds of analyses have been performed on the data? Please explain.

2. Are the values used in the indicator raw data? Aggregated data? Calculated data? Inferred data? Last sentence deleted, redundant with 1.

3. Are these analyses standard methods? Please reference.

4. Were these results published? If yes please give reference or link.

5. Were these results peer reviewed? If yes by whom? Give references.

6. How were the values calculated or determined?

7. Please describe the basis of the classification scheme? Why was this scheme chosen?
8. How are the values interpreted?

9. Are there established ranges that indicate the state of the environment? If yes how were these values established? Are the values consistent across the spatial extent of the data set?

10. Is the Indicator developed based on a model? If so, what is this model?

11. Has the model been published?

12. Has the model been peer reviewed?

13. How are data gaps handled when the model is applied?

14. What is the scientific inference process used to generalize from site-specific information to the national coverage?

15. Which of the following was used to generalize or portray data beyond the specific sampling points?

    a) Defensible statistical survey analysis inference procedures used to generalize to entire United States. (e.g., current OW National Lake Fish tissue contaminant survey, FIA, FHM, NRI)
    b) Defensible statistical model inference procedures used to generalize to entire United States (e.g., generation of wet deposition maps for US or generation of air quality information using kriging).
    c) Semi-empirical environmental/ecological model predictions. (e.g., USGS use of SPARROW model to predict nutrients in rivers based on statistical relationships and simple hydrologic flow models)
    d) Generalization is restricted to sites visited and it is possible to give a well-defined, meaningful definition of the portion of the ecological resource covered.
    e) No generalization possible and no meaningful way to identify the subset of the ecological resource represented by the collection of sites.

F. Data Accessibility

1. Are the data readily available? If yes, please give reference, link or contact.

2. Are the summary reports available? If yes, please give reference, link or contact.

3. Have these results been published? If yes, please give reference.

G. Message or Interpretation

1. Are the messages or answers to the questions appropriate, sound, and understandable?

References:
EMAP Indicator Development Strategy (EPA/620/R-94/022)
Evaluation Guidelines for Ecological Indicators (EPA/620/R-99/005).
EMAP Assessment Framework